Journal of Analytical Chemistry 2014 vol.69 N12, pages 1165-1170

Evaluation of the antioxidant capacity of cognacs and brandies by differential pulse voltammetry

Ziyatdinova G., Salikhova I., Budnikov H.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2014, Pleiades Publishing, Ltd. Components of cognacs and brandies form anodic peaks at 0.44 and 0.59 V in the differential pulse voltammogram recorded on a glassy carbon electrode modified with multiwalled carbon nanotubes in phosphate buffer solution at pH 3.0. The effect of the pH of the supporting electrolyte and pulse parameters on the analytical signal is evaluated. It was found that the peak at 0.44 V is integral in nature; gallic acid contributes to this peak. The peak at 0.59 V is a result of the oxidation of ellagic acid. We developed a method for the evaluation of the antioxidant capacity (AOC) of cognacs and brandies by differential pulse voltammetry and tested it on nine samples. The total area of two oxidation steps was selected as a parameter characterizing the antioxidant properties. Antioxidant capacity was expressed in equivalents of ellagic acid per 100 mL of a beverage. Correlations between the AOC of beverages and their total AOC and ferric reducing power (r = 0.9752 and 0.9539 at P = 0.95, respectively) are found.

http://dx.doi.org/10.1134/S1061934814120168

Keywords

alcoholic beverages, antioxidant capacity, differential pulse voltammetry, food analysis, modified electrodes, phenolic antioxidants